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# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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February 2, 1993

TO: Minerals File

FROM: Holland Shepherd, Senior Reclamation Specialist *HS*

RE: Field Inspection, Goldstrike Mine Site, Tenneco Minerals, Inc. Mine,  
M/053/005, Washington County, Utah

Date of Inspection: January 27, 1993  
Time of Inspection: 10:00 a.m. - 4:00 p.m.  
Conditions: Sunny, cool  
Participants: Jim Smith, Robert Wilson, Tenneco Minerals; Larry Gore, Greg Zufelt, BLM; Holland Shepherd, DOGM

The purpose of this inspection was to follow up on an emergency cyanide discharge that was conducted at the operation last week. Also, this inspection was conducted to follow up on the development of the mine operator's amendment to the plan that was submitted last winter of 1992. The amendment described the development of several new pits and a large leach pad at the mine site.

## Emergency Discharge

We first met at the mine site at the operator's office with Mr. Jim Smith, Mine Manager and Mr. Robert Wilson, Environmental Coordinator. We discussed the storm events that had been plaguing the operation with an excess amount of water; and discussed how the operator had taken steps to mitigate the problem. We discussed how the operator had conducted a controlled emergency discharge, and the steps the operator had taken to mitigate the impacts of the discharge. Also discussed, were the steps that would be taken in the very near future to mitigate for the existing large excess volume of water and for future events.

Approximately 11 inches of precipitation has fallen on the mine site since the 1st of January, 1993. The operator ended up with an excess amount of water in the processing system and ponds and started discharging that water on Tuesday, January 19, 1993. The



Page 2  
Field Inspection  
M/053/005  
February 2, 1993

discharge continued until Sunday, (January 24, 1993) the following week. Approximately 400 gallons per minute (gpm) was discharged from the mine site during that time period. The operator discharged about 2.448 million gallons of treated water over this time frame.

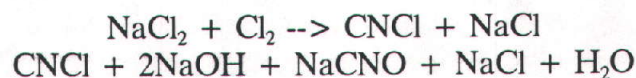
Before the operator discharged the process solutions, sodium cyanide contained in the solution, was killed using chlorine gas. The sodium cyanide which was about 10 ppm (free cyanide), in solution, before treatment with chlorine gas, was discharged at an average of .8 ppm (at point of discharge). Measurements taken during the discharge, at this point and others downstream, were done with a HACH kit. Measurements with the HACH kit will only evaluate free cyanide. These measurements are very rough. The operator also took samples, which were sent off to Chem Tech labs in Salt Lake City. The lab analysis will be more accurate and cover more constituents.

When the discharge was initiated, and up to the present, the operator has been taking water samples at various locations at the discharge point and then on downstream along Quail Creek down to the East Fork of Beaver Dam Wash. At the confluence of Quail Creek and East Fork of Beaver Dam Wash, the reading was .2 ppm. The Drinking Water MCL is .2 ppm free cyanide.

According to information received from the Division of Water Quality (DWQ), Class 3A stream channel levels for free cyanide are .022 ppm for the 1 hr avg and .0052 ppm for the 4 day average. Measurements taken by DWQ follow: .957 ppm, at the discharge point; .800 ppm, at the sediment pond; *not 272 ppm* .272 ppm, in Arsenic Gulch below the sediment pond; and .03 ppm, at the confluence of Arsenic Gulch and the East Fork of Beaver Dam Wash.

Lyle Stott, of DWQ, was on site on January 20, 1993, to collect samples during the discharge. Wayne Thomas with the County Health Dept. took background samples prior to the discharge.

We discussed some of the other constituents in the discharge water that might also be detrimental to the stream environment. These would include sodium chloride and any metals that might be residual in the solution. Sodium chloride is formed when the chlorine gas is added to the cyanide solution breaking off the sodium from sodium cyanide and the chlorine from the chlorine gas forming sodium chloride:





The operator is evaluating the full suite of cyanide, metals and salts so that when the analysis report is written up within 2-3 weeks, we will have a pretty good idea regarding the potential problem with salts or metals in the solutions that were released.

According to our discussions with the operator, a large percentage of the metals entering solution during normal process, should be removed by the operation's new carbon absorption process. The Merrill Crowe process, that was being used, was not able to remove metals as well. Also, the new carbon absorption method needs less cyanide.

The operator maintains a 0 discharge permit with the State of Utah, Division of Water Quality, which means the operator cannot discharge any processed waters from the site. However, because of the problems of excess solutions and overflow in the system, the operator was forced to discharge solution from the process circuit. I was informed that the Division of Water Quality (DWQ) will probably write a violation as a result of the operator not being able to meet permit requirements.

According to the operator, at the time of release, millions of gallons of background rainwater was being washed from the East Fork of Beaver Dam Wash and mixing with any solutions that were being discharged from the mine site, diluting them dramatically.

JBR Consulting is responsible and has been contracted with Tenneco to help evaluate and write up the report on the emergency discharge. They have been collecting samples over the last week and will continue to do so and will write up the report and have it ready for reading within about 3 weeks. Bob Bayer of JBR is leading this assignment.

#### **Padre Pit**

After discussions in the office, we set out on the field inspection portion of this visit. We headed first to the Padre Pit. The Padre Pit has been completed, they are through mining, they are presently in the middle of regrading the Padre waste dump and backfilling the Padre Pit to the point where the pit will no longer be impounding. A large slide has occurred on the southwest end of the Padre Pit; this portion of the highwall has virtually collapsed and is now resting at angle of repose. The rest of the highwall is still intact.

We stopped next at the Padre topsoil storage pile location. It is a very large stockpile that has been protected by a silt fence all the way around the base. The silt fence is functioning well, and is helping to prevent topsoil loss. Because of the recent storm activity, some gullying has developed on some of the steep slopes of the stockpile;



the silt fence is acting to prevent the escape of much of the material. The operator planted this stockpile about a year and a half ago and presently a good stand of plants has taken root on the stockpile. These are also helping to control erosion. The plant community consists mostly of tall wheatgrass and annual rye. Also, there is a great deal of palmer penstemon growing on the pile, some sage can be seen growing and some other weedy species. The species that the operator has chosen appear to be adapting well to the site.

### **Emergency Storage Ponds**

The operator has constructed an emergency pond on the southwest side of heap leach #1. The pond contains 3 million gallons of process water, and is currently full. This particular pond was existing prior to the rainstorm events, and was empty, but did not have the capacity to hold all of the water that fell on the site over the last 3-4 weeks. The operator has constructed a second emergency pond. This was just completed last week. This particular pond holds 3.7 million gallons of water and is presently holding about 1 million gallons of water. The pond is located at the top of an older portion of heap leach #2.

The operator indicated that they can contain another 3-4 million gallons of water which may fall onto the site. Beyond that, they have no more storage capacity. The operator has indicated that 1 inch of rain will equate to approximately 1 million gallons of accumulated water over this site.

The operator has proposed the construction of another emergency pond, perhaps making it a permanent pond. They discussed making this a 5 or 10 million gallon pond. The operator has indicated that they can have it built within the next two weeks. This may be particularly important because the rainy season has not really affected this part of the country yet. They can expect more rain in February, March and April.

The operator is required to place bird netting on all solution ponds on the site. To net one pond costs about \$40,000-\$50,000. The operator has asked that the Division, the Division of Water Quality and the BLM consider that they not net the pond if the cyanide solutions in the pond are killed down to drinking water standard which is .2 ppm total cyanide. Netting the pond is required to prevent avian mortalities. According to literature coming out of Nevada, most bird mortalities occur when solutions contain >50 ppm free cyanide. The operator has also made the request that if the cyanide solutions in the pond is reduced to .2 ppm total cyanide, that they be allowed to utilize this water on the roads for dust control.



Page 5  
Field Inspection  
M/053/005  
February 2, 1993

### **Hamburg Pit**

We next visited the Hamburg Pit area. This has also been completed. The operator is currently dumping waste material at the bottom of this pit filling it up to the point where it will no longer be impounding.

The operator indicated that the reclamation performed on the west side of Hamburg Peak 2 years ago, was doing well. We did not visit the site, but from a distance the reclaimed area seemed to be supporting a young community of reclamation species.

### **Sediment Pond**

We next visited the operation's sediment pond. The pond is presently holding water. There is some apparent leakage of the water that can be seen on the downstream part of the pond impoundment structure. However, the pond is doing better than the last time the operator had problems with excess water at the site. The pond was upgraded about a year and half ago after the Division pointed out that it was not functioning adequately as a sediment pond.

### **Basin Pit, Covington Pit and Caribou Pit**

The operator is currently developing the portion of the site, that consists of the Basin Pit, Covington Pit, and the Caribou Pit. These three pits are currently under construction and are being mined. The material is being taken and deposited on top of heap leach #1.

The haul road, which is under construction has not been completed to the point of meeting up with the County road. It is hoped by the operator that the County and the BLM will accept this road as an alternate to the present county road that accesses the mine site. The present county road washes out just about every time there is a big storm. There is no adequate channeling of stream drainage in portions of the canyon where the road runs through it. The road essentially becomes the streambed during big storm events. To build the road up higher and get it out of the canyon and the stream channel, would be a great asset to the public and the environment.

jb  
cc: Jim Smith  
M053005